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Experimental Tests of Fundamental Symmetries in Particle Physics

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Deadline for manuscript submissions:
31 May 2024

Message from the Guest Editors

Dear Colleagues,

Physics has been the cornerstone of the search for symmetry in the laws of nature for hundreds of years. In particle physics, symmetry is closely related to the fundamental forces and particles that make up the universe. In this Special Issue, we focus on experimental tests of the most fundamental symmetries in particle physics, including the symmetry between matter and antimatter, the conservation of charge, and the conservation of lepton and baryon numbers.

Papers in this Special Issue will explore the latest experimental results and theoretical developments in the field, covering a wide range of topics, including the following:

- CP violation in the leptonic sector (oscillation experiments DUNE, Hyper-K, NOvA, T2K, etc.);
- CPT violation in neutrino physics and/or atomic physics;
- Leptonic number violation: neutrino-less double-beta decay experiments;
- CP violation in the quark sector: mixing matrix unitarity (LHCb experiment).

We welcome submissions from researchers at the frontiers of particle physics, as well as from researchers exploring interdisciplinary linkages between particle physics and other fields and beyond.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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